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10/783,440	02/20/2004	Toshiaki Yoshihara	1100.69785	7797

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EXAMINER	
SHERMAN, STEPHEN G	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/783,440	YOSHIHARA ET AL.	
	Examiner	Art Unit	
	STEPHEN G. SHERMAN	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendment filed 1 February 2008. Claims 1-14 are pending.

Response to Arguments

2. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makino et al. (US 2002/0008683) in view of Yoshihara et al. (US 2002/0154078).

Regarding claim 1, Makino et al. disclose a liquid crystal display device comprising:

a liquid crystal panel (Figure 4, element 21);

a light source for emitting light to be incident on said liquid crystal panel (Figure 4, element 22);

a synchronizing unit for synchronizing control of turning on said light source with data scanning based on image data to be displayed on said liquid crystal panel in a predetermined period (Figure 4 shows CONTROL SIGNAL GENERATION CIRCUIT 31 which receives a synchronization signal and provides a control signal to each of the DATA DRIVER 32, BACK-LIGHT CONTROL CIRCUIT 35, and the REFERENCE VOLTAGE GENERATION CIRCUIT 34. See paragraph [0070]);

a data scanning unit for scanning a plurality of times of first-half data scannings and a plurality of consecutive second-half data scannings following said first-half data scannings within the predetermined period (Figure 4 shows SCAN DRIVER 33, which will perform all of the scanning shown in Figure 34. Figure 34 shows a plurality of scannings. The examiner interprets that the first two address periods shown in the frame are the “plurality of first-half data scannings” consisting of one data-writing

scanning and one data-erasing scanning, and that the second two address periods shown in the frame are the “plurality of second half data scannings” consisting also of one data-writing scanning and one data-erasing scanning performed consecutively.); and

a control unit for turning on said light source after the plurality of first-half data scannings begin and turning off said light source before the plurality of second-half data scannings end (Figure 4 shows BACK-LIGHT CONTROL CIRCUIT 35, which will perform the control of the backlight as shown in Figure 34. Figure 34 shows that the backlight is turned on only during the period RP, which means that it is turned on after the first-half data scannings begin and that it is turned off before the second-half data scannings end.).

Makino et al. fail to explicitly teach wherein the plurality of first-half data scannings are "similar" and that the plurality of consecutive second-half data scannings are "similar".

Yoshihara et al. discloses a liquid crystal display device comprising a data scanning unit for scanning a plurality of similar first-half data scanning, and scanning a plurality of consecutive similar second-half data scannings following the scanning of the first-half data scannings within a predetermined period (Figure 10 shows that the first-half data scannings shown as "DATA-WRITING SCANNING" as performed consecutively and then afterwards the second-half data scannings shown as "DATA-ERASING SCANNING" as performed consecutively.).

Therefore, because Makino et al. and Yoshihara et al. both teach a data scanning unit for performing a plurality of data scannings, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made substitute one method of scanning for the other to achieve the predictable result of performing the scanning of the lines.

Regarding claim 8, Makino et al. disclose a liquid crystal display device comprising:

a liquid crystal panel (Figure 4, element 21);

a light source for emitting light to be incident on said liquid crystal panel (Figure 4, element 22);

a synchronizing unit for synchronizing control of turning on said light source with data scanning based on image data to be displayed on said liquid crystal panel in a predetermined period (Figure 4 shows CONTROL SIGNAL GENERATION CIRCUIT 31 which receives a synchronization signal and provides a control signal to each of the DATA DRIVER 32, BACK-LIGHT CONTROL CIRCUIT 35, and the REFERENCE VOLTAGE GENERATION CIRCUIT 34. See paragraph [0070]);

a data scanning unit for scanning a plurality of times of first-half data scannings and a plurality of consecutive second-half data scannings following said first-half data scannings within the predetermined period (Figure 4 shows SCAN DRIVER 33, which will perform all of the scanning shown in Figure 34. Figure 34 shows a plurality of scannings. The examiner interprets that the first two address periods shown in the

frame are the "plurality of first-half data scannings" consisting of one data-writing scanning and one data-erasing scanning, and that the second two address periods shown in the frame are the "plurality of second half data scannings" consisting also of one data-writing scanning and one data-erasing scanning performed consecutively.); and

a switching unit (Figure 4, CONTROL SIGNAL GENERATION CIRCUIT 31 and BACK-LIGHT CONTROL CIRCUIT 35) for switching between a first method in which said light source is turned on during the plurality of first-half data scanning and is turned off during the plurality of second-half data scannings (Figure 28 shows that in Mode A the backlight is turned ON during the address periods for both the first data writing scanning and data erasing scanning, i.e. first-half data scannings, and that the light source is turned OFF during the address periods for both the second data writing scanning and data erasing scanning, i.e. second-half data scannings.) and a second method in which said light source is turned on when the plurality of first-haft data scannings begins and is turned off when the plurality of second-haft data scannings end (Figure 28 shows that in Mode B the backlight is turned ON when the first data writing scanning begins, i.e. when the first-half data scannings begin, and that the light source is turned OFF when the second data erasing scanning ends, i.e. when the second-half data scannings end. The examiner realizes that the backlight is actually turned from on to off during the middle retention period RP, but as shown in the figure, the backlight remains off throughout the second-half data scannings and is therefore turned off when they end.).

Makino et al. fail to explicitly teach wherein the plurality of first-half data scannings are "similar" and that the plurality of consecutive second-half data scannings are "similar".

Yoshihara et al. discloses a liquid crystal display device comprising a data scanning unit for scanning a plurality of similar first-half data scanning, and scanning a plurality of consecutive similar second-half data scannings following the scanning of the first-half data scannings within a predetermined period (Figure 10 shows that the first-half data scannings shown as "DATA-WRITING SCANNING" as performed consecutively and then afterwards the second-half data scannings shown as "DATA-ERASING SCANNING" as performed consecutively.).

Therefore, because Makino et al. and Yoshihara et al. both teach a data scanning unit for performing a plurality of data scannings, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made substitute one method of scanning for the other to achieve the predictable result of performing the scanning of the lines.

Regarding claim 9, Makino et al. and Yoshihara et al. disclose the liquid crystal display device of claim 1.

Makino et al. also disclose wherein a liquid crystal material for use in said liquid crystal panel has spontaneous polarization (Claim 7 found on page 9 of the publication.).

Regarding claim 10, Makino et al. and Yoshihara et al. disclose the liquid crystal display device of claim 8.

Makino et al. also disclose wherein a liquid crystal material for use in said liquid crystal panel has spontaneous polarization (Claim 7 found on page 9 of the publication.).

6. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makino et al. (US 2002/0008683) in view of Yoshihara et al. (US 2002/0154078) and further in view of Yoshihara et al. (US 2002/0000960).

Regarding claim 3, Makino et al. and Yoshihara et al. (US 2002/0154078) disclose the liquid crystal display device of claim 1.

Makino et al. and Yoshihara et al. (US 2002/0154078) fail to teach wherein a voltage applied to said liquid crystal panel in one or a plurality of times of first-half data scannings and a voltage applied to said liquid crystal panel in one or a plurality of times of second-half data scannings are equal in magnitude and opposite in polarity.

Yoshihara et al. (US 2002/0000960) disclose of a liquid crystal display device wherein a voltage applied to said liquid crystal panel in one or a plurality of times of first-half data scannings and a voltage applied to said liquid crystal panel in one or a plurality of times of second-half data scannings are equal in magnitude and opposite in polarity (Figure 7(b)).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to make the voltages of the first and second half scanning taught by the combination of Makino et al. and Yoshihara et al. (US 2002/0154078) be opposite in polarity as taught by Yoshihara et al. (US 2002/0000960) in order to provide for a period of time wherein liquid crystal is in a display state in each pixel to be equal to each other, and thus, no fluctuation in luminance occurs.

Regarding claim 4, Makino et al. and Yoshihara et al. (US 2002/0154078) disclose the liquid crystal display device of claim 1.

Makino et al. and Yoshihara et al. (US 2002/0154078) fail to teach wherein a darker display is obtained by one or a plurality of times of second-half data scannings compared to one or a plurality of times of first-half data scannings.

Yoshihara et al. (US 2002/0000960) disclose of a liquid crystal display device wherein a darker display is obtained by one or a plurality of times of second-half data scannings compared to one or a plurality of times of first-half data scannings (Figure 7(b) shows of having a first scanning and a second scanning, while Figure 12 shows of having multiple first scanning and multiple second scanning, where the second scanning is used for erasing by applying a negative polarity voltage, meaning that a darker display will be accomplished by the second scanning periods.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to make the voltages of the first and second half scanning taught by the combination of Makino et al. and Yoshihara et al. (US 2002/0154078) be

opposite in polarity as taught by Yoshihara et al. (US 2002/0000960) in order to provide for a period of time wherein liquid crystal is in a display state in each pixel to be equal to each other, and thus, no fluctuation in luminance occurs.

7. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makino et al. (US 2002/0149576) in view of Yoshihara et al. (US 2002/0154078) and further in view of Nitto et al. (US 2003/0123258).

Regarding claim 5, Makino et al. and Yoshihara et al. disclose the liquid crystal display device of claim 1.

Makino et al. and Yoshihara et al. fail to teach wherein a brightness distribution of said light source is uneven in a data scanning direction.

Nitto et al. discloses a liquid crystal display device wherein a brightness distribution of said light source is uneven in a data scanning direction (Figures 10-11 shows that there is a light source at the top and the bottom of the display, meaning that the light distribution will inherently be uneven in the data scanning direction.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the idea of having two incident light sources as taught by Nitto et al. in the liquid crystal display device taught by the combination of Makino et al. and Yoshihara et al. in order to account for display irregularities usually found around the edges of the display.

Regarding claim 6, Makino et al., Yoshihara et al. and Nitto et al. disclose the liquid crystal display device of claim 5.

Nitto et al. also disclose a liquid crystal display device wherein the brightness of a light source is lowest in a center in the data scanning direction and increases from the center toward upstream and downstream sides in the data scanning direction (Figures 10-11 shows that there is a light source at the top and the bottom of the display, where inherently the light intensity will degrade are the light is further from the source, thus resulting in the light intensity on the two edges of the panel being the greatest and the intensity in the middle being the lowest.).

Regarding claim 7, Makino et al., Yoshihara et al. and Nitto et al. disclose the liquid crystal display device of claim 5.

Nitto et al. also disclose wherein the brightness of said light source is lowest in a center in the data scanning direction, increases from the center toward upstream and downstream sides in the data scanning direction, and is higher on the downstream side than on the upstream side (Figures 10-11 shows that there is a light source at the top and the bottom of the display, where inherently the light intensity will degrade are the light is further from the source, thus resulting in the light intensity on the two edges of the panel being the greatest and the intensity in the middle being the lowest, and since the intensity of the light sources can be changed and the lights can degrade, the brightness of the bottom light sources can be greater than that of the top light source.).

8. Claims 2 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makino et al. (US 2002/0149576) in view of Yoshihara et al. (US 2002/0154078) and further in view of Tanaka et al. (US 2002/0149576).

Regarding claim 2, Makino et al. and Yoshihara et al. disclose the liquid crystal display device of claim 1.

Makino et al. and Yoshihara et al. fail to teach wherein said light source is turned on at substantially an intermediate time point of a first of said plurality of first-half data scannings and turned off at substantially an intermediate time point of a first of said plurality of second-half data scannings.

Tanaka et al. disclose a liquid crystal display device wherein a light source is turned on at substantially an intermediate time point of a first scanning and turned off at substantially an intermediate time point of a second scanning (Figure 4A and 4C show that the light source is turned on half way through the first scan and turned off half way through a second scan.).

Therefore, it would have been obvious to “one of ordinary skill” in the art at the time the invention was made use the method of turning on the backlight taught by Tanaka et al. with the plural scanning method taught by the combination of Makino et al. and Yoshihara et al. such that the backlight would e turned on during halfway through the first data-writing scanning and turned off halfway through the second data-writing scanning in order to improve the uniformity of luminance and insuring sufficient brightness while saving power consumption.

Regarding claim 11, Makino et al. and Yoshihara et al. disclose the liquid crystal display device of claim 1.

Makino et al. and Yoshihara et al. fail to teach wherein said light source emits light of at least three primary colors, and a color display is performed by switching the color of light emitted by said light source in a time-divided manner in synchronism with ON/OFF driving of switching elements.

Tanaka et al. disclose of a liquid crystal display device, wherein a light source emits light of at least three primary colors (Paragraph [0053]), and a color display is performed by switching the color of light emitted by said light source in a time-divided manner in synchronism with ON/OFF driving of switching elements (Figures 4A-4C).

Therefore, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the sequential backlight method taught by Tanaka et al. in the display system taught by the combination of Makino et al. and Yoshihara et al. in order to provide better color reproducibility.

Regarding claim 12, Makino et al. and Yoshihara et al. disclose the liquid crystal display device of claim 8.

Makino et al. and Yoshihara et al. fail to teach wherein said light source emits light of at least three primary colors, and a color display is performed by switching the color of light emitted by said light source in a time-divided manner in synchronism with ON/OFF driving of switching elements.

Tanaka et al. disclose of a liquid crystal display device, wherein a light source emits light of at least three primary colors (Paragraph [0053]), and a color display is performed by switching the color of light emitted by said light source in a time-divided manner in synchronism with ON/OFF driving of switching elements (Figures 4A-4C).

Therefore, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the sequential backlight method taught by Tanaka et al. in the display system taught by the combination of Makino et al. and Yoshihara et al. in order to provide better color reproducibility.

Regarding claim 13, Makino et al. and Yoshihara et al. disclose the liquid crystal display device of claim 1.

Makino et al. and Yoshihara et al. fail to teach wherein said light source emits light of white color, and a color display is performed by selectively transmitting the light emitted from said light source through color filters of a plurality of colors.

Tanaka et al. disclose of a liquid crystal display device, wherein the light source emits light of white color, and a color display is performed by selectively transmitting the light emitted from said light source through color filters of a plurality of colors (Paragraph [0056]).

Therefore, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the sequential backlight method taught by Tanaka et al. in the display system taught by the combination of Makino et al. and Yoshihara et al. in order to provide better color reproducibility.

Regarding claim 14, Makino et al. and Yoshihara et al. disclose the liquid crystal display device of claim 8.

Makino et al. and Yoshihara et al. fail to teach wherein said light source emits light of white color, and a color display is performed by selectively transmitting the light emitted from said light source through color filters of a plurality of colors.

Tanaka et al. disclose of a liquid crystal display device, wherein the light source emits light of white color, and a color display is performed by selectively transmitting the light emitted from said light source through color filters of a plurality of colors (Paragraph [0056]).

Therefore, it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the sequential backlight method taught by Tanaka et al. in the display system taught by the combination of Makino et al. and Yoshihara et al. in order to provide better color reproducibility.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEPHEN G. SHERMAN whose telephone number is (571)272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SS

6 March 2008

/Amr Awad/
Supervisory Patent Examiner, Art Unit 2629